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Hacking the Yak: The Chinese Effort to Improve a Tibetan Animal in the Early Twentieth Century*

Mark E. Frank

[Mark E. Frank is a Ph.D. candidate in East Asian Languages and Cultures at the University of Illinois at Urbana-Champaign. His current project looks at the environmental history of Chinese state-building on the Tibetan plateau during the early twentieth century. The archival research for this project, including research for this essay, was made possible by an IIE Fulbright Research Fellowship in 2015-2016. Contact: mark.ernstmeyer.frank@gmail.com]

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Abstract: This article considers the roles of yak bodies in relations between Han Chinese and Khampa Tibetan communities during the early twentieth century. It argues that bovine bodies were sites of Han-Tibetan interaction wherein culture, biology, and locality were intertwined. I chronicle the earliest large-scale engagement of the Chinese state with yak pastoralism in the context of its efforts to consolidate control over the eastern Tibetan region of Kham. Yak husbandry is traditionally an enterprise of Tibetans and other Himalayan ethnic groups, but the yak was targeted for 'improvement' by Han Chinese modernizers beginning in the 1930s. An effort to decouple the yak from its Tibetan cultural context at the Taining Experimental Zone saw mixed results. Livestock scientists there made modest gains in productivity, yet they did so by approximating to a high degree the nomadic mode of production from which they were attempting to extract the yak.

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The spring of 1943 saw an inter-ethnic grazing dispute between two communities that were separated by a pair of hills in the Sino-Tibetan borderlands. A Chinese state farm named the Taining Experimental Zone (*Taining shiyan qu* 泰寧試驗區) stood accused of letting hundreds of yaks devour and trample the barley crop of a nearby Khampa Tibetan village known to the Chinese as *Manzigou* 蠻子溝.[1] What truly happened remains a mystery by virtue of the fact that the beasts in question could not speak Chinese, but to its chagrin, the provincial Bureau of Agricultural Improvement (*Nongye gaijin suo* 農業改近所) was forced to defend itself to the governor against its neighbors' suit. Calling it a "conspiracy against the facts," bureau chief Duan Tianjue 段天爵 insisted that "there is no way that [the yaks] could have eaten and trampled the barley sprouts" of Manzigou.[2]

How did the modern Chinese state get involved in the yak business, and why? Prior to the twentieth century yak herding was an enterprise of Tibetans and other Himalayan ethnic groups not including the Han.[3] Han observers of Tibet have seized on grazing disputes as an unseemly feature of Tibetan yak pastoralism.[4] The irony cannot have been lost on Duan, then, when he found his Chinese state farm drawn its own minor range dispute. For Duan the yak was not an inherently "Tibetan animal" as the title of this essay—a deliberate provocation—suggests. But his dilemma invites reflection: where non-human organisms are deeply embedded in human cultures—as are yaks in Tibetan culture—does the transfer of those organisms to other contexts necessarily entail cultural transmission? And how do animals' physical bodies figure as sites of ethnic interaction? Through a detailed historical case study, this essay portrays the role of yak and other bovine bodies as *vectors of cultural exchange* between Han and Tibetan communities. Much as disease vectors can have a transformative influence on the pathogens they transmit, I propose that yak bodies, as

[1] The name *Manzi gou* in this source might be translated as 'barbarian gully.' It does not appear on any map that I have seen.

[2] Sichuan Provincial Archives, Min 民 249-1-24.

[3] Ethnic groups known to have herded yaks include the Qiang, Menba, Luoba, Sherpa, and Mongols, among others. See Wiener *et al.* (2003), pp. 3-5.

[4] For example, in 1930 the ethnologist Ren Naiqiang wrote of Khampa yak pastoralists that "each clan has a definite territory, and they may not trespass one another's. They become enemies with their trespassers, often plundering their yaks and horses in lieu of a fine, at which the other clan must take revenge." See Ren (2010), p. 20. Writing on the Amdo region, Emily Yeh notes that Tibetan range disputes continue to vex the Chinese state, even as CCP policy on the fencing of ranges appears to be making these disputes more commonplace. See Yeh (2003), pp. 514-520.

vectors of cultural exchange, played an active role in the cultural forms they appeared to transmit.

This essay chronicles the earliest large-scale engagement of the Chinese state with yak pastoralism in the context of its efforts to consolidate control over the eastern Tibetan region of Kham. Plans to convert the Kham region into a province of the Republic of China prompted intensive Chinese research into industrial yak husbandry within Kham beginning in the late 1930s, accompanied by a concerted effort to decouple the yak from its ethnic Tibetan cultural context. The latter half of the article zooms in on the livestock station in Taining, where experiments pitted indigenous livestock techniques like 'natural grazing' with modern ones such as foddering and seemed to empirically demonstrate the superiority of scientific farming. Interestingly, Taining was also a syncretic Han-Tibetan community, and a site where the Chinese state approximated conventionally Tibetan production methods in order to maintain its herds of highland animals, even as it modified them (both methods and animals).

Until recently, the fields of modern Chinese and Tibet studies typically engaged each other through simplistic narratives of political oppression and resistance between the metropoles of Beijing and Lhasa. In the past several years, historians and anthropologists have produced nuanced re-evaluations of the oppression-resistance narrative by training their lens on less elite communities in the borderlands. Among their insights is the fact that resistance to assimilation often operated within inter-ethnic networks at the local level, shattering the illusion of an autonomous or 'pure' Tibetan resistance to Chinese oppression.[5] Gray Tuttle writes that China's Sichuan Province served as "a middle ground between the centralized administrations of China and Tibet" that "proved more capable of flexible innovation than the cultural centers of either nation" during the early twentieth century.[6] The overlapping Kham region played a similar role. I hope to add fresh perspective to our understanding of the Sino-Tibetan borderlands as a 'middle ground' by extending my analysis not only to syncretic human networks, but beyond the human.[7]

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[5] For example, see Pirie (2013), Yeh (2003).

[6] Tuttle (2007), p. 127.

[7] Richard White famously adopted the phrase 'middle ground' as shorthand for "a quite particular historical space" (the *Pays d'en Haut* of North America) that was the outcome of intercultural contact in which the various parties "justif[ied] their own actions in terms of what they perceived to be their partner's cultural premises;" White (2010), p. xii. As White acknowledges, the notion of the 'middle ground' has sometimes been compellingly applied to other world regions; White (2010), pp. xiv-xv. I believe my analysis of Chinese yak improvement in this essay satisfies the brief definition of the 'middle ground' above, in that Chinese yak improvement represented a compromise with the Tibetan pastoral population

Figure 1. A yak photograph featured in the Chinese journal Popular Science.

Source: "Kang nan feng guang," p. 430.
Note: The caption accompanying this image in the source states that "the maoniu 犛牛 (yak), also called maoniu 毛牛, is tall and large in stature, its entire body covered in black hair, and it cannot survive under three thousand meters."

The Yak in Tibetan Context

If you know one word of Tibetan, it is probably *yak*—though as speakers of Tibetan are quick to point out, that word refers only to the male in their language, while the female is called a *dri*. (I shall adhere to English usage here, using *yak* to refer to both male and female.) The species has traditionally been associated with Tibet, and with Tibetan nomads in particular. But observers have produced contradictory accounts of the historical relationship between Tibetans and the yak. For some, Tibetan

based on broad Chinese misunderstandings of Tibetan nomadism, as described below. Admittedly, the paucity of Khampa Tibetan sources from this period make it difficult to determine historical intentions on the Tibetan side.

mobile yak pastoralism is a primitive livelihood marked by extreme conformity with nature, while others have described it as an elaborate technical exercise. Published sources from the early twentieth century reveal a correlation between how non-Tibetans viewed Tibetans and how they viewed yaks: those who viewed Tibetan culture as primitive tended to also view the yak as an under-domesticated animal.

The question of whether (and to what extent) Tibetans domesticated the yak hinges on the definition of 'domesticated.' Recent debates highlight the tension between two competing paradigms of domestication. Natural scientists have conventionally invoked a 'biological definition,' which posits that an animal is domesticated when its morphology and behavior meet a list of criteria such that they exhibit what some have called 'domestication syndrome.' Docility (or 'tameness') is the hallmark of domestication syndrome, typically accompanied by the retention of juvenile features, including reduced brain size.[8] This biological paradigm is predicated on the expectation that domestication involves extreme human domination of domesticates, including near-total control over domesticates' reproduction resulting in their genetic isolation and distinctness from wild ancestors.[9] Some anthropologists point out that such a rigid understanding of domestication rules out cases in which animals have been thoroughly integrated into human society without such an extreme degree of domination. For example, Fiona Marshall and Lior Weissbrod observed that a single Maasai community paid great attention to horse pedigree while allowing its donkeys to procreate freely, which the researchers attribute to the fact that the community under study valued donkeys for their load-bearing strength and had little regard for their pedigree or sociability, in contrast with its attitudes towards horses. Yet commonsensically, both animals are 'domesticated.'[10] Similarly, geneticist Ludovic Orlando notes that Mongolians often allow their horses to roam freely and 'capture' them only as needed, because this is more practical than continuous domination.[11] Many social and natural scientists now advocate weighing the biological definition of domestication against a 'cultural definition' that takes pragmatics into account.[12]

Early European encounters with yaks produced some confusion over their status with regard to domestication. A British travel writer observed

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[8] Clutton-Brock (2012), p. 8; Ritvo (2004), p. 214.

[9] Ingold (2000), p. 75; Saey and Engelhaupt (2017), p. 22.

[10] Marshall and Weissbrod (2011), p. S405.

[11] Quoted in Saey and Engelhaupt (2017), p. 23.

[12] For example, see Outram (2014), p. 759; Saey and Engelhaupt (2017), pp. 22-23. The implication of 'cultural' here is not so much that we should defer to a given culture's definition of domestication, but that we should frame our understanding of domestication in reference to a species' practical role in a given cultural context.

in 1874 that "even the yaks of burden, which have been domesticated, or rather half domesticated, for generations, are exceedingly wild, and the only way they can be managed is by a rope attached by a ring through the nose."[13] Only after 1875 did taxonomists register a distinction between the 'domesticated yak' (*Bos grunniens*), and the 'wild yak' (*Bos mutus*), corresponding to the Tibetan distinction between *yak* and *drong*.[14] Even contemporary observers note that the domesticated yak is not particularly docile, nor is it as genetically divergent from its wild ancestor as the typical farm animal.[15] By biological criteria that emphasize domination, yak domestication appears incomplete, especially when the transformation from *mutus* to *grunniens* is juxtaposed with the coeval transformation from the auroch to the ox—a common frame of reference for lowland peoples. Indeed, one historical paradigm to which I will return situates the yak on a trajectory parallel to that of the ox or the pig, but with some catching up to do.

An alternate interpretation emphasizes human adaptation over domination. Zooarchaeologist Juliet Clutton-Brock notes that the proximity of *grunniens* to its wild ancestor preserves its highland niche, so that "as a pack animal and provider of milk, the yak enabled humans to colonize the mountainous regions of Tibet and Nepal."[16] We might speculate that, as with the Maasai donkey, the load-bearing role of the yak has disincentivized selection for docility among herders, given that such selection tends to produce smaller animals.[17] In this appraisal, the yak's influence on Tibetan society is not incompatible with human ingenuity, in that adaptation to the yak is understood to be a highly technical accomplishment. Indeed, those who have closely investigated Tibetan yak production, including ethnologists, ethnographers and scientists, tend to emphasize its technical complexity. I synthesize some of their findings here, not to provide a comprehensive overview of the yak's role in Tibetan society, but merely to establish three points that are of later relevance to the essay: (1) that yak domestication is ancient in origin, (2) that yaks were and are the subject of an elaborate system of indigenous knowledge, and (3) that yak production was not the domain of a monolithic 'nomadic' lifestyle.

Jianlin Han of the Chinese Academy of Agrarian Sciences, summarizing the findings of an international constellation of scientists, notes that initial domestication of the yak must have occurred approximately ten thousand years ago, and that DNA evidence points to a single domestication event

[13] "The Yak of Thibet" (1874).

[14] Wiener *et al.* (2003), p. 9.

[15] Clutton-Brock (2012), p. 85.

[16] *Ibid*.

[17] Tibetans do produce more docile bovids by breeding yaks with oxen, a process I shall examine shortly.

on the Qinghai-Tibetan Plateau (meaning that Mongols and other yak herders beyond the plateau were eventual beneficiaries of this feat).[18] Domestication of the wild yak (*Bos mutus*) is usually attributed to the Qiang 羌, an ancient civilization thought to be ancestral to Tibetans (as well as modern Qiang) and which the Food and Agriculture Organization of the United Nations describes as "quite possibly the earliest animal husbandry culture of excellence in the world."[19] DNA and archaeological evidence points to a major expansion in yak production about five thousand years ago. The breeding of female cattle (*Bos taurus*) with male yaks (*Bos grunniens*) to produce hybrids has been traced to 1100 BCE, though according to Han, it intensified in the middle of the twentieth century—precisely the period with which this study is concerned.[20] Yak pastoralism is thought to have originated on the southeast of the plateau, corresponding to the western portion of modern Sichuan Province (and the overlapping Tibetan region of Kham); today western Sichuan is also host to the world's largest yak population (4,084 as of the year 2000, not including hybrids).[21] In other words, yak husbandry has benefited from millennia of experience plus many hundreds of generations of passive and active selection, even if these techniques did not conform to the scientific method *per se*.

Tibetan mobile pastoralists often identify (and are identified by their Tibetan neighbors) as *drokpa* (Wiley: *'brogs pa*), a term that is typically translated as 'nomad.'[22] But those who picture the Tibetan nomad as moving erratically or, as Chinese observers often put it, "chasing the water and the grass" (*zhu shui cao er ju* 逐水草而居) are mistaken; unlike peripatetic or 'wandering' nomads (such as Gypsies and Thuggees), the *drokpa* are *transhumant* nomads, meaning that they move methodically between a certain number of pre-selected locations according to the season. The most basic principles of yak transhumance in high-altitude settings are that animals must move higher as the temperature rises and lower as it drops, and that animals must move shorter distances when they are most vulnerable to effects of the weather (the onset of spring); the *drokpa* clan will have designated pastures whose spatial distribution adheres to these principles. From a sedentist perspective, such mobility is unusual and *drokpa* may appear to be unduly influenced by their animals. Recent scholarship, however, has inverted this narrative by arguing that settled

[18] Han (2013).

[19] Wiener *et al.* (2003), p. 3.

[20] *Ibid.*, p. 3.

[21] *Ibid.*, p. 7.

[22] Robert Ekvall more accurately translates *drokpa* as 'high pasturage ones;' see Ekvall (1968), p. 3.

agriculture reflects a high degree of plant influence on humans in exchange for dubious benefits to individual people.[23]

In fact, sedentary agriculture appears to have facilitated high-altitude nomadism such that *drokpa*-style nomadic pastoralism arguably represents *an evolution of sedentary agriculture, or an escape from it*. The farmer and nomad are linked by a continuum of production methods through which individuals may transition from the more temperate conditions of the lowlands to the harsher conditions of the highlands. Robert Ekvall, who conducted extensive field research in Amdo (northeast Tibet) between 1926 and 1941, noted the existence of an intermediary social category called the *sa ma drok* (Wiley: *sa ma 'brog* meaning literally, "neither soil nor high pasture") that practiced a semi-nomadic lifestyle.[24] Ekvall was able to observe the evolution of households from one mode of production to the other—not from nomadism to farming, as sedentary outsiders have often assumed, but from farming to semi-nomadism and then (sometimes) to full nomadic pastoralism.[25]

The multi-step process Ekvall describes implies the transmission of detailed technical knowledge across generations. Farm households typically kept a small number of cattle, but once the herd of a farming household reached a certain size, the farmers might establish a separate summer pasture within a day's reach, both to give the herd ample grazing room and to protect the year's crop from those same animals; the herd returned to the farm after the harvest. Some households retained their farms while others abandoned them entirely, rotating between pastures with the seasons. While Ekvall notes that *sa ma drok* households never achieved an identity as *drokpa* regardless of their livelihood (and perhaps predominated at a lower altitude than the latter), the *sa ma drok* lifestyle provided excellent technical training in nomadic pastoralism and many individuals were incorporated into *drokpa* lifestyles through marriage or other means. Further, these seminomadic households occupied an important niche in the pastoral economy as an intermediary between farmers and *drokpa*; for one thing, with access to both cattle and yaks they were ideally positioned to breed the hybrids known in Tibetan as *dzo* upon which many *drokpa* relied for dairy and other purposes.[26]

Moving from lowland farm to high pasture was not simply a matter of preference in that it required a high degree of technical knowledge. Anthropologist Rinzen Thargyal provides unique insight into this body of

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[23] For example, see Diamond (1987); Harari (2015), pp. 87-109; Scott (2017).

[24] Anthropologist Rinzen Thargyal has also described the *sa ma drok*, but Ekvall was the first scholar to describe their transition from sedentary to nomadic pastoral production in detail.

[25] Ekvall (1968), pp. 21-23.

[26] *Ibid.*, pp. 20-21.

indigenous knowledge through his interviews with nomadic households that were exiled from Kham's Zilphukhog Valley by the Communists in 1957. While in Kham, his informants had practiced strategic gelding, retaining some virile bulls (or *chu-yak*) for breeding but castrating other bulls for use as docile pack yaks. Keeping track of livestock fertility was key to successful husbandry, and Thargyal's informants had an elaborate scheme for identifying the age of yaks, including unfamiliar ones, first by counting their teeth and later, after the age of seven years, by counting the lines (or *trü*) on their horns.[27] The naming scheme that Thargyal records for yaks at each age is corroborated by Namkhai Norbu, who conducted his field research in Dzachuka in 1951 and who reports that the average yak there reached 10 *trü*, corresponding to 17 years.[28] *Drokpa* took care not to milk yak cows (*dri*) too early since this could starve their calves and put an early end to milk production ("to starve *dri* calves is a self-destructive act for a pastoral nomad" notes Thargyal) but were more likely to eventually starve the calves of yak-ox hybrids (*dzo*), which are known to be less valuable for most purposes than their parents.[29] We should recognize that in addition to these token details, Tibetan nomads have developed a vast amount of tacit knowledge that would be difficult or impossible to transcribe, and that would be lost if their way of life were to disappear.

Popular discourse outside of Tibet has tended to ignore the technical complexity of yak transhumance and has instead constructed it as primitive and simplistic. Observers often painted a caricature of Tibetan society as neatly divided between nomads and sedentary Tibetans; for example, a journalist for the *North-China Herald and Supreme Court & Consular Gazette* pontificated in 1914 that "the population of Tibet falls naturally into two divisions, namely, those who live in tents and those who live in temples. The people may roughly be divided into priests and nomads."[30] 'Nomads' figured in Chinese-language discourse as *youmu min* 游牧民 or 'ranging herders,' an apparent adaptation of the Japanese *yūbokumin* 遊牧民. The notion of the ethnos or *minzu* 民族 remained ill-defined during this period (in comparison to its later Communist usage), and nomads throughout Inner Asia were sometimes even referred to as *youmu minzu* 游牧民族, a sort of para-ethnic category. The term *niuchangwa* 牛場娃 was further implemented as a rough loan-translation of *drokpa*, *niuchang* being the Chinese term for yak pastures. The Chinese journal *Xin Yaxiya* 新亞細亞 (*New Asia*) remarked that "the ethnos (*minzu* 民族) of Tibet can be approximately divided into two groups. The first are the house-

[27] Thargyal (2007), pp. 76-78.
[28] Norbu (1997), pp. 39-40.
[29] Thargyal (2007), p. 78.
[30] "Among Tibetan Nomads: A Picturesque People, the Ways of the Yak."

dwellers (*fangshewa* 房舍娃), and the second are the *niuchangwa*." The author claimed that Tibetan house-dwellers were "almost the same as us Han," while the *niuchangwa* were "entirely unlike us Han."[31]

Such writers were wont to focus on 'pure' nomads, ignoring the complex gradations between farmer and nomad as observed by ethnologists, or relegating them to impurities within an otherwise binary economy. Concern with the 'pure' nomadic Tibetan took on eugenic dimensions, and paralleled the rise of the 'pure Han' as a concept in Chinese and international discourse.[32] Ren Naiqiang, the preeminent Han scholar of Kham, contended that the Han lived in the lowlands of Kham while the 'pure Tibetans' lived on the high plains herding livestock, and their mixed-blood offspring inhabited the spaces in between.[33] The very concept of the 'nomad' seems to encourage this kind of binary, since it is a simplification that obscures the complex range of lifestyles is attempts to describe.[34] In the imagination of sedentary peoples, the 'nomad' is essentially primitive, violent and a relic of the pre-modern past—prejudices that infiltrate even contemporary historical scholarship.[35]

International appraisals of nomads as barbarians living in something like a state of nature made it easy to interpret their livestock as undomesticated or under-domesticated. In 1914 the *North China Herald* imagined Tibetan nomads as passive beneficiaries of the easy predisposition of their animals, since "the yak gives the nomad little or no trouble and though *undomesticated* [my emphasis], is a quiet and timid animal."[36] Positivist theories of social evolution generally posited that nomads were at a more primitive stage of development than sedentary peoples, and the ingenuity involved in domestication must have seemed

[31] Wang (1930), p. 23.

[32] Zhihong Chen traces the notion of the 'pure Han' to the writings of Ellsworth Huntington and Zhang Qiyun in the early twentieth century; see Chen (2012), pp. 85-88.

[33] Ren (1990), pp. 219-220.

[34] In their critique of the term 'nomadism,' Caroline Humphrey and David Sneath note that "pastoralism in the vast grassland region of Inner Asia is not timeless 'nomadism' but is a series of local knowledges and techniques located in particular historical circumstances." See Humphrey and Sneath (1999), p. 1.

[35] For instance, historian Michael Khodarkovsky describes the nomadic groups along the steppes of the Russian empire as "societies organized for war" (Khodarkovsky (2002), p. 17), while Jane Burbank and Frederick Cooper write of Eurasian nomads generally that "nomadic life meant that the whole society could be mobilized for war" and that "the point of war was plundering, sharing out the booty, and moving on to get more;" Burbank and Cooper (2010), p. 99.

[36] "Among Tibetan Nomads: A Picturesque People, the Ways of the Yak."

beyond the nomad, prompting the (mis)conception that *Bos grunniens* was docile yet unaltered by its human hosts.

It is in this milieu that the monolithic 'nomad' became the target of Chinese nationalist discourse on the yak. The entire species was characterized by its participation in a backwards mode of development and thus its potential for improvement by the Han was self-evident; the key was extraction from nomadism. For example, in a 1943 essay titled "Nomadic and Sedentary Pastoralism," one Dong Qin 凍沁 traces the divide between sedentism and nomadism to the ancient sage king Fuxi 伏羲, whose guidelines for the sustainable raising of livestock were articulated in the *Rites of Zhou* (Zhou li 周禮). The Han were those who had received the transformative influence (*hua* 化) of Fuxi, while the nomads on the western frontier were those who had not. Dong faults the decline of the Qing dynasty over the previous two hundred years with facilitating nomadism, because "the people have not been opened to knowledge."[37] Dong's nomads, which seem to be based mainly on secondhand reports, are utterly devoid of science. He writes that "many of the residents of the northwest have been stuck in a rut, following the water and the grass, and I hear that the livestock must live and perish of its own accord for they don't know how to improve it." He then cites Chiang Kai-shek as saying that "Argentina in South America is the world's greatest producer of meat, and yet the pastures of our own northwest could displace Argentina if they were opened up and properly developed."[38]

Dong's polemic reflects a synthesis of Han chauvinism with the global paradigm of 'improvement.' An early watchword of scientific agriculture, 'improvement' typically referred to increasing yields per unit of livestock or unit of land, and was inspired by the marketization of agricultural products in Europe beginning in the eighteenth century. Its infiltration of Chinese discourse as *gailiang* 改良 or *gaijin* 改近 gave Chinese and international agrarians a common idiom for discussing Tibet. In an article on the founding of Xikang province (Xikang sheng 西康省), *The Christian Science Monitor* had this to say:

> Tibet's nomads have been ignorant of how to care for the Yak. In Minya, west of Tasienlu [Kangding], many cows give only a quart or so a day and the price of highly-watered milk is high. To the nomad "a yak is a yak, and who ever heard of improving a yak? And why improve the yak?" As the nomad sees it, an improved yak may give more milk, and more milk may give more cheese,

[37] Dong (1943), p. 34.
[38] *Ibid.*, p. 34

> which will produce more money. But more money will mean more expense… so why improve the yak?[39]

'Value' (*jiazhi* 價值) became the arena in which industrialized, scientific production sought to compete with nomadic production. "The value of the yak is indeed great," wrote a contributor to *Xikang Economy Quarterly* in 1944, "but knowledge among the people is shallow and they do not recognize its value."[40] Indigenous nomadic pastoralism was doubly troublesome because of its inferior economic output and its problematic mode of social organization; sedentary peoples worldwide have historically viewed nomadism as a chaotic form of social organization. It is not untrue that *drokpa* in Tibet have been among the most difficult populations to assimilate into the Chinese nation. If, as I have previously argued, resistance to coercive state domination should itself be considered a *product* of transhumance, then we ought not to evaluate this mode of production purely in terms of its tangible output.[41] Not surprisingly, that product was unappreciated by Chinese nationalists, for whom value referred to *market* value.

Commodification: Taking the Yak out of Context

For many years the material of choice for Santa Claus wigs was yak tail—a fact amusing to both westerners, for whom the yak seems quite exotic, and yak producers in China, for whom Santa Claus seems quite exotic. When applied to the face with Spirit Gum, beards of this material looked full and felt natural to children sitting on red-robed laps, and these prosthetics are still available for impersonators willing to pay several hundred U.S. dollars apiece. Yak tail exports were one subject of a famous Tibetan trade mission to the United States in 1948, sparking speculation among the Chinese over why Americans could possibly be interested in that commodity; as the *Los Angeles Times* reported, "after some confusion, it developed that yak tails are used as beards for superduper Santa Claus costumes."[42]

When an American documentary team in Kham interviewed a *drokpa* patriarch named Locho about his life for the recent film *Summer Pasture*, he articulated that he had been "following the yak's tail" since the age of six. Here Locho invokes the yak tail not as commodity, but as shorthand for a lifestyle that he is hesitant to abandon for deeper integration into the

[39] "China Builds 'Inner Empire' With 'Go-West' Movement."
[40] Xu (1944), p. 111.
[41] Frank (2016). My argument here builds on that of Scott (2010).
[42] "China Questions Yak Tales of Yak Tail Traders in U.S."

market economy.[43] The mass commodification of yak tails in the early twentieth century resembles an exaggerated instance of what Karl Marx dubbed the 'estrangement' of the worker to the products of his labor, in that it was geared towards products thoroughly irrelevant to the lives of the vast majority of people who produced and harvested these tails, except as a source of income.[44] In the twentieth century yak products became bulk commodities traded on a global market for the first time. The Chinese state deliberately fostered a shift from subsistence yak herding among Tibetans towards integration of the industry into regional, national and international markets. In Marxian terms, the state has limited regard for the *use value* of yaks in an indigenous context but became interested in the animal once its *exchange value* was evident.[45]

This divorce of yak production from its Tibetan cultural context was facilitated by new and distinctly modern frameworks for human-yak interaction. One was the zoo. Ian Miller has described the zoo as an exercise in 'taxonomic perfection' that, through strategic physical separation, replicates Linnaean ordering in physical space and juxtaposes the animal against the observing human—a phenomenon he calls 'ecological modernity.'[46] Zoos introduced audiences worldwide to the yak beginning in the late nineteenth century, but entirely out of cultural or ecological context.[47] Had you lived in Boston in 1932 your first encounter with *Bos grunniens* might have been Licorice, an orphaned yak calf born at the Franklin Park Zoo, who befriended a resident emu in 1932; the two were known to eat and sleep side-by-side, and the *Daily Boston Globe* termed theirs the "queerest of friendships."[48] While most zoos kept only a token number of yaks for display, Whipsnade Wild Animal Park has maintained an entire healthy herd of pure yaks in the temperate fields of

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[43] True *et al.* (2011).

[44] In articulating his theory of estrangement Marx writes that "the object that labor produces—labor's product—confronts it as *something alien*, a *power independent* of the producer;" Marx (2011), p. 69. I am not intimately familiar with the conditions under which these yak tails were produced, and it is possible that they would not meet all of Marx's criteria for alienation of the worker, which he describes in reference to an industrialized setting.

[45] In Marxian theory, 'use value' refers to the applications of an object that are specific to that object's material properties, while 'exchange value' refers to an object's exchangeability on the market. For an extended discussion of these two concepts, see Marx (2011), pp. 41-48.

[46] Miller (2013), p. 2.

[47] As of the year 2000, 110 zoos worldwide had registered as holding yaks at some point, most in low-altitude settings far removed from the animals' natural habitats. See Wiener *et al.* (2003), p. 342.

[48] "Emu and Yak Form Queerest of Franklin Park Zoo Friendships."

Dunstable Downs, England from 1944 to the present. Exhibitions like these have been instrumental in demonstrating that the yak could not only survive but thrive in settings very different from the frigid, low-oxygen regions to which they are endemic.[49] Children in Europe may even have dreamt of keeping one as a pet while they read Hilaire Belloc's *The Bad Child's Book of Beasts* (first published 1896):

> As a friend to the children,
> Commend me the Yak.
> You will find it exactly the thing:
> It will carry and fetch,
> You can ride on its back,
> Or lead it about with a string.[50]

Another framework was the laboratory, a close cognate of the zoo. Like zoos, experimental farms isolated and decontextualized the yak for the sake of science, contributing to the project of ecological modernity.[51] One early site was the United States federal experiment station in Fairbanks, Alaska, which obtained a yak and several Galloway cows to produce a hybrid, which they labeled the 'cattleyak' in 1927.[52] The premier site for yak research within China was founded in 1937 in the grasslands of southern Kham, at a site known as the Taining Experimental Pastures, to which the latter portion of the essay is devoted. Even after a decade of robust research, in 1948 an observer to the Taining project remarked that "although the yak is broadly distributed in our country, its position in science would still seem to linger within the realm of mystery."[53]

The sciences of animal morphology and Mendelian genetics were instrumental in establishing the yak as a set of commodities. Morphologists measured yak bodies in minute detail, describing anatomical features that were easily translatable into marketable products. Unlike genetics, for instance, morphology is a distinctly comparative science, and scientists focused on delineating differences between *Bos grunniens* (the yak) and *Bos taurus*, the domestic cattle familiar to most Chinese, American and other bovine farmers. Early Chinese livestock records tended not to differentiate

[49] Wiener *et al.* (2003), p. 345.

[50] Belloc and Blackwood (1896), pp. 161-163.

[51] It might be argued that ecological modernity does not simply 'decontextualize' animals but in fact contextualizes them in new ways, such as by situating them within the Linnaean taxonomic classificatory system.

[52] "Hybrid to Provide Meat for Alaska."

[53] Liang (1948), p. 6.

Figure 2. Illustration from The Bad Child's Book of Beasts.

Source: Belloc and Temple (2008).
Note: This is a reproduction of one of four images by Basil Temple Blackwood that accompanied the original 1896 printing of Belloc's poem, "The Yak."

between those species, referring to them both as *niu* 牛, indeed creating difficulties for the historian who wishes to track the yak. Apart from assorted travel writings, it would seem that there was little interest in yak distinctness until approximately the 1930s. Then, suddenly, yak science benefited from something like what Sigmund Freud called the "narcissism of small differences."[54] The anatomical proximity of the yak to the cow, rather than obscuring its presence, became an object of fascination; it was recast as a deviant bovine in the press. "The yak, which is produced in the hamlets of Tibet and the Himalayas, is the most peculiar member of bovinae," remarked a popular science article in 1941.[55] Some differences were obvious and easily spotted in the photographs or illustrations that appeared in popular science articles (e.g. Figure 1): for starters, the yak is

[54] Freud (1991), p. 131.
[55] Rong (1940), p. 157.

distinguishable from the ox by its short, stout legs and hairy underbelly—ideal for keeping balance while crossing high mountain passes. It had a short tail with long hair, "shaped like a round fan" according to one author.[56] Other differences were not so obvious: The yak has 14 ribs, two more than the ox. Scientists also noted regional differences: for one, yak bulls in Kham were far more likely to be horned than those of Mongolia.

Lists of marketable raw materials that could be extracted from the yak typically included hair, meat, dairy, fat, bone and horn. Chinese advocates of yak improvement emphasized the marketability of yak products beyond a Tibetan cultural context. For instance, yak meat, typically in the form of jerky, had long been a popular specialty item (*techan* 特產) among Han in western China. Yak butter, though an essential ceremonial and food item in Tibetan households and temples, was unpalatable to most Han; but with further refinement its rancidity could be mitigated, making it more broadly appealing. Other markets were even less intuitive, such as the market for yak-tail Santa beards.[57]

Inter-species hybridization became another potential avenue for improvement. It was no secret that the offspring of female *grunniens* and male *taurus*, known in Tibetan as a *dzo* and in Chinese as a *pianniu* 犏牛, was more lucrative than either of its parents for many purposes. The male *dzo* (*dzo-po*) is infertile, meaning that maintaining a herd of *dzo* required access to both oxen and yaks for breeding purposes. The female *dzo* (*dzo-mo*) could in fact be bred with either of its parent species, producing an animal known in Chinese as an *aguoniu* 阿果牛; the female of this species could technically be bred with yaks or oxen but the offspring were notoriously feeble. Husbandry experts speculated intensely over how best to employ each of these species—ox, yak, *dzo* and *aguoniu*—in various environments. A common opinion was that the yak was an optimal beef source (in fact, yak meat was valued more highly than cattle beef in the interior provinces), while the *dzo* was superior for dairy and load-bearing work (ploughing and transport).[58]

The direct impetus for Chinese involvement in yak production was the 1939 establishment of Xikang, a new province in the Sino-Tibetan borderlands west of Sichuan whose centerpiece was the Kham region. Chinese involvement in yak production was indisputably reluctant, and state actors emphasized grain agriculture over pastoralism wherever possible, but the environmental characteristics of this 'high-cold' (*gao han*

[56] Liang (1948), p. 6.

[57] One writer for *Bianjiang Tongxun* (Border dispatches) explained to Chinese readers in 1948 that "every Christmas in the countries of Europe and America, when people dress up as Santa Claus, the wigs that they wear are made of yak tail;" Liang (1948), p. 6.

[58] For example, see Xu (1944), p. 112.

高寒) zone made pastoralism an economic necessity. In preparing for accession to province-hood, local administrators collected extensive data on regional commerce, revealing that the slated province was a net importer of food but that yaks were a major export item.[59] A 1943 county-by-county survey of land use found that the area of viable pasture equaled or exceeded viable farm land in many counties, including Dege 德格, Taining 泰寧, Danba 丹巴, Daocheng 稻城, Dengke 登科 and Luhuo 爐霍.[60] A contributor to *Xikang Economy Quarterly* argued in 1944 that "when talking about the economy of Kangding 康定 (a historical capital of Xikang Province), you cannot but treat the yak as central (*zhongxin* 重心)."[61]

Hacking the Yak: State-sponsored Animal Research at the Taining Experimental Pastures

1945: Livestock scientists based at an experimental site in Kham traveled to the city of Kangding to deliver a talk at the Celebration of Victory in the War of Resistance. Their talk, titled "Note that New Livestock Techniques Can Enrich the Country and Benefit the People" (*Zhuyi muxu xin fa keyi fu guo li min* 注意牧畜新法可以富國利民), drew on some six years of wartime research at the Taining Pastures in the grasslands northeast of Kangding.[62] Two mandates characterized the work of the Taining site: 'improving' livestock and 'extending' (*tuiguang* 推廣) new knowledge. The notion that Tibetans were ignorant about how to improve their animals implied that livestock scientists like those in Taining *did* know how to improve them.

In 1936, the same year that plans for establishing Xikang Province were announced, a member of the Xikang Preparatory Committee named Zhang Zhiyuan 張志遠 embarked on a land survey in the Kham region and chose a section of Daofu 道孚 County in which to establish the Provincial Agricultural and Pastoral Experiment Site (*Shengli nong mu shiyan chang* 省立農牧試驗場); when the Committee launched the site in 1937, Zhang became its first chief.[63] The site's livestock holdings included mainly bovines (cattle, yaks and hybrid *dzo*), ovines (sheep and goats), and equines (horses)—more conventional Chinese livestock like pigs and chickens were relegated to a lower-altitude site near Kangding. Upon the founding of Xikang Province in 1939 the Provincial Agricultural and Pastoral Experimental Site was subsumed by the new Xikang Province Bureau of

[59] Sichuan Provincial Archives, Min 民 231-1-7.

[60] Sichuan Provincial Archives, Min 民 234-1-253.

[61] Xu (1944), pp. 111-114.

[62] Sichuan Provincial Archives, Min 民 249-1-13, p. 45.

[63] *Ibid.*, p. 47.

Agricultural Improvement and renamed the Taining Experimental Zone (*Taining shiyan qu* 泰寧試驗區); after 1945 it was incorporated into a new county named Qianning 乾寧 and again renamed. (For the sake of simplicity I will simply refer to it as the Taining site.)

Livestock science at Taining portrayed the yak in largely quantitative terms, with little regard for its Tibetan cultural context. Morphological comparisons with the cow differentiated the two species primarily as a matter of degree. The yak breathed 22-48 times per minute, the cow just 15-30. The yak's heart beat 42-52 times per minute, the cow 40-50. The yak reached sexual maturity much later and gestated a little longer on average.[64] Meanwhile, farm economists supplemented sensational reports about grunting, hairy beasts with banal cost-benefit analyses. Deborah Fitzgerald notes that agricultural economics were key to the expansion of American agriculture in the early twentieth century such that "it was numbers, not narrative, that became the dominant language of agricultural knowledge."[65] In China as in the U.S., farm economics enabled a small number of agricultural experts to make sense of farm conditions across a culturally and ecologically diverse nation. A cattle expert from southeast China could work with the yak so long as it was quantified.

The notion of the 'livestock unit' or LSU exemplifies this approach: farm economists devised the LSU as a way of converting diverse species into a single unit for grazing and feed purposes. At Taining, one horse or bovid (including yaks) equaled one LSU (*jiachu danwei* 家畜単位), and so did five ovine animals (sheep or goats), meaning that five sheep were expected to consume as much grass and fodder as a single yak. In 1946 when the site held 57 bovids, seven horses and 238 sheep, administrators calculated that they currently held 112 livestock units. The livestock unit was useful for calculating fodder consumption on a grand scale: for example, in 1946 Taining administrators determined that their current store of 41,500 kilograms of stalks, 7,650 kilograms of beans, 4,000 kilograms of oats, 12,500 kilograms of wheat and 1,500 kilograms of hay would be sufficient to feed their 112 livestock units for three months.[66]

In determining how much area a single livestock unit required for grazing, Taining scientists drew on global livestock research, but at the same time, they recognized that both the yak and the grasslands environment of Kham were distinctive. In one experiment they took the creative measure of tying a yak to a pole with a rope of known length and

[64] These findings are printed in an annual work report. See Sichuan Provincial Archives, Min 民 249-1-13, p. 49.

[65] Fitzgerald (2010), p. 35.

[66] Sichuan Provincial Archives, Min 民 249-1-13, p. 45. The source document gives these weights in *shijin* 市斤 rather than kilograms. One *shijin* equals half a kilogram.

waiting to see how long it would take to exhaust the grass within its reach. This experiment, titled "Research into the Grazing Potential of the Grasslands," followed a single yak for a year and recorded its grazing volumes in detail. In the first four months of 1946 when grass had withered, the experiment's yak had to be moved six times daily and exhausted about 96 square *zhang* 丈 (about 1,230 square meters) of grasslands per day, so that it required a total of 192 *shimu* 市亩 (12.79 ha) for the season. In the spring (May-June) and autumn (November-December), observers found that the grass regenerated within eight days, reducing the area per season to a mere 8.66 *shimu* (0.58 ha). In the summer (July through October), grass regenerated within three days, further reducing its minimal grazing area to a little more than 0.2 hectares. In the course of a single year, the test yak had demanded about 204.66 *shimu* (13.64 ha) of the Bamei 八美 grasslands—in fact notably less than the averages from Nebraska and Nevada, where cattle were found to need about 259.[67] Experiments like this allowed Taining scientists to quantitatively evaluate the potential of 'natural grazing' (*tianran fangmu* 天然放牧), the standard scientific term for nomad-style grazing.

A major motive for studying that method was to test it against alternatives: could the inferiority of *drokpa* production be quantitatively proven? Another experiment at the Taining site sought to answer this question. From July through September 1939, Zhang Zhiyuan led a study in which herders fed their yaks varying amounts of grain fodder and measured their milk production and weight on a daily basis. The yaks were divided into four groups based on feeding methods: 'heavy fodder,' 'standard fodder,' 'subsistence-level fodder,' and a control group that underwent 'natural grazing.' The results demonstrated that cattle given grain fodder unequivocally produced more dairy and fat than those subjected to natural grazing. Cattle given standard levels of grain produced over 55% more milk and 57% more fat per day than those naturally grazed; even cattle given subsistence levels of grain produced 18% more milk and 20% more fat per day than naturally grazed cattle.[68]

However, investigators recognized that their most impressive findings might not translate well to a regional scale, and they signaled this insecurity through caveats in their reports. The internal report for the 1943 grazing experiment notes that "because of limitations on man-power, we used only one yak and carried out the experiment only in the grassy valleys of Bamei. If we were able to use more cattle, horses or sheep and test the livestock of each given area separately in each given area, this would form a basis for grasslands management and would truly be a work

[67] Sichuan Provincial Archives, Min 民 249-1-13, p. 43.

[68] Zhang (1939), pp. 4-5.

of prime value and importance."[69] Similarly, the published report for the 1940 fodder experiment concedes that while grain-fed cattle were clearly superior, it remained uneconomical to feed cattle with local grain at current prices, which the report terms the 'greatest drawback' (*zui da quedian* 最大缺點) of the project. Undeterred, author Zhang Zhiyuan notes that grain can be imported from the nearby counties of Danba 丹巴 and Xichang 西昌 as well as the nearby provinces of Sichuan and Shaanxi, and estimates that just enough dairy can be produced to turn a profit at current Sichuan market rates.[70] Close attention to the wording of these caveats reveals that they were not couched as *failures*, but rather as mandates for greater state intervention in the Kham region.

Throughout the subsequent decade and beyond, the Taining site would focus its livestock improvement energies on altering the vegetation of the cold farming belt, and by effect, changing livestock diets. The fertility of highland soils was quite limited, so site managers focused on growing enough to supply livestock during the colder half of the year from November to May, a period when indigenous herds typically lost weight and suffered most from attrition. Several major cold-bearing fodder crops were grown on-site: highland barley, peas, rye, wheat and hay (or cultivated grass), and eventually, potatoes. Many of the varieties that the Bureau of Agricultural Improvement advocated for lower-altitude counties were inappropriate for northern Kham, where frost and hail destroyed entire crops, but Taining scientists identified particular local varieties that the Bureau would eventually promote throughout the region; in 1947 Governor Liu Wenhui 劉文輝 (1895-1976) himself signed an order to promote a 'Taining #45 Wheat' and 'Taining #27 Highland Barley' within Kham.[71] Even indigenous grass was pitted against imported varieties. In 1946, 51 American grazing grasses (*mucao* 牧草) were tested against 11 indigenous grass varieties; 17 of the foreign varieties took root and 7 American grasses were observed to 'flourish' in the Bamei valley.[72] Some of these, such as smooth brome (*Bromus inermis Kansas*), would be promoted as optimal grazing grasses by the Bureau of Agricultural Improvement throughout Kham.[73]

The processing of yak products was another avenue for 'improvement.' Yak butter was in high demand among Tibetans, and highly priced. The *North-China Herald and Supreme Court & Consular Gazette* commented in 1939 that "rancid yak butter is and will continue to be the *pièce de résistance*

[69] Sichuan Provincial Archives, Min 民 249-1-13, p. 43.
[70] Zhang (1939), p. 5.
[71] Sichuan Provincial Archives, Min 民 249-1-45.
[72] Sichuan Provincial Archives, Min 民 249-1-13, p. 42.
[73] Sichuan Provincial Archives, Min 民 249-1-45.

in the nomad's menu. He drinks it, eats it, rubs it on his body, offers it to his god and burns it in his temple."[74] Unlike yak meat however, consumption of traditional yak butter had difficulty crossing into the Chinese market as it was too pungent for most Han Chinese (as well as foreigners). Taining administrators noted in their 1945 work report that "the yak butter that Khampas produce is very much lacking in clarity and is not conducive to packaging."[75] By the mid-1940s, Taining had imported both English and Danish butter churns and food scientists were working to produce something more palatable to consumers outside Tibet. The result, of which the Bureau was quite proud, was a more refined butter that they named 'stupa butter' (*baita you* 白塔油). In 1945 alone, Taining packaged about 400 pounds (181 kg) of white stupa butter, along with 180 *shijin* (90 kg) of dried meat.[76]

When observing the animal whose heart beat up to 44 times per minute, who devoured up to 96 square *zhang* of grasslands in a single day, or whose milk output increased 55% with a change in diet, scientists were reliant on the notion of the *species* (yak, *dzo*, ox, etc.) for the relevance of their findings beyond the experimental zone. In the context of community livestock extension, emphasis on species over individual animals made pragmatic sense; "for a theory to be properly applied," notes S. Barry Barnes, "the particular thing or process to which it is applied must be relevantly the same as those existing things or processes to which it has already been properly applied."[77] Unfortunately, scientific reports couched in terms of universal types make it difficult to understand how people historically interacted with animals at places like the Taining Experimental Zone beyond the experimental construct. In that sense the scientific notion of the species is thoroughly decontextualizing, contributing to public perceptions of the yak as an ahistorical class of animals in contrast with the historical, nomadic lifestyle through which it was managed in the past. We might imagine that in Taining, at the very least, the yak transcended its nomadic past through the concentrated efforts of its Chinese hosts—but this was not exactly the case. The next section will briefly outline the larger context in which Taining's yak science occurred, revealing a surprising convergence of Chinese state livestock management with that of indigenous herders.

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[74] "Yak Butter Shortage."

[75] Sichuan Provincial Archives, Min 民 249-1-13, p. 41.

[76] *Ibid.*, p. 42.

[77] Barnes (2004), p. 107.

The Nomadic Republic of China: Yak Science in Social Context

In *Laboratory Life*, Bruno Latour and Steve Woolgar argue that "science is entirely fabricated out of circumstance; moreover, it is precisely through specific localized practices that science appears to escape all circumstance."[78] This is not to say that laboratory results are false, but merely that once established as 'facts,' they can be relieved of the historical circumstances of their production, and employed by networks of people beyond the experimental site, including scientific communities and the press. Indeed, the neat published reports on the Taining site belied a messier, more complicated set of localized practices. A look into the unpublished archives of the Bureau of Agricultural Improvement reveals that behind every scientific observation at Taining was a syncretic community where Han migrants and Khampa Tibetans melded indigenous knowledge and practices with new methodologies to manage animals that had wills of their own. Or put differently: in trying to develop scientific yak management, the Chinese state found itself dabbling in nomadism.

Bovine herd management at Taining closely paralleled local practices, and much of the labor was in fact done by Khampas. In establishing his experimental zone, Zhang Zhiyuan settled over 90 Khampa refugee households (*taowang hu* 逃亡戶) evading violence and natural disaster of recent years, and employed some as laborers.[79] A site inventory from a few years later reveals the use of yak-hair tents and white cloth tents, both essentials of *drokpa* life. The site's spatial features also mirrored indigenous practice to a high degree. Unlike most of Xikang's state farms, the Taining site was arranged in three distinct branch sites each between five and fifteen kilometers from the others and separated by alpine forest, allowing for seasonal migration of its bovine and ovine livestock. The site migrated its yaks between up to five different pastures or 'zones' (*qu* 區) much like a *drokpa* clan. The altitudes and types of these pastures resembled those of indigenous herders: in the winter months animals were housed at the site's Niujiaoshi Livestock Pastures (*Niujiaoshi xumu qu* 牛角石畜牧區), in spring they moved out to the Bamei Plain (*Bamei Pingyuan* 八美平原) and the stretch south of Mengzi Gulley (*Mengzi gou* 蒙子沟), and in the warmest month of July yak were taken up to the top of Xiang'e Mountain (*Xiang e gao shan* 象鵝高山), with two intermediary pastures on the way up and down.[80]

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[78] Latour and Woolgar (1986), p. 239.

[79] *Yi min zhi bian*, p. 15.

[80] Sichuan Provincial Archives, Min 民 249-1-13, p. 45.

There is evidence that Taining's animals dragged the Chinese state into grasslands disputes, a well-known (if unideal) feature of *drokpa* life. The site became involved in multiple disagreements over stray bovines with the nearby village of Manzigou, whose Chinese name might be translated as 'Barbarian Gully.' A pair of disputes in 1943 merited direct appeal for instructions from Duan Tianjue, then the chief of the Bureau of Agricultural Improvement, to Liu Wenhui, founder and governor of Xikang Province. A detailed record of these disputes exists only because Duan saw fit to report it to his superiors, so it gives us but modest insight into what was surely an ongoing series of interactions between Taining and neighboring communities.

The first incident occurred in the fifth month of the lunar calendar (June 1943) when a herd of bovids (*niu* 牛)[81] repeatedly wandered into Taining's Niujiaoshi area, prompting a testy exchange between the Taining site manager and nearby villagers. Manzigou was situated about 2.5 kilometers from the Niujiaoshi branch site and, as I noted at the beginning, separated from it by two large hills (*shan* 山); moreover, the stretch of grasslands between Niujiaoshi and Manzigou had been purchased by the experimental station. In some ways resembling a 'savage' reflection of the Taining site, Manzigou had a holding of over 200 bovine animals and grew its own crops, primarily barley. According to Duan, "the yaks and sheep (*niu yang* 牛羊) of that village frequently trespass," and though pasturing in the grasslands that separated the site from the village was officially prohibited, "it is to no avail."[82]

On the eighth of the month (June 11), the branch chief discovered damage to the oats crop and checked in with the night watchman, who reported that on the previous night, about sixty head had wandered onto the farm and were grazing on oats before he chased them away and warned to the villagers to be more careful in the future. When the animals returned soon afterwards, the site chief chose to detain them and demanded a fine for damages. Finally an elderly man arrived at the site claiming to be their sole owner, and insisting that he had no one to pasture them and was too feeble to meet the terms of the bureau. After he refused to pay a fine, the bureau chose to confiscate 12 animals as a penalty, arguing that over sixty head could not possibly belong to one old man. A certain Peng De 彭德 of Manzigou apparently filed a complaint against the Bureau of Agricultural Improvement for confiscating his animals. The

[81] In all cases Duan referred to the animals as *niu* 牛 (bovids), so it is impossible to say for certain what bovine species they belonged to—but given the altitude and the predominance of yaks in livestock inventories, it is highly likely that they were mostly yaks or *dzo*, or a mix of the two, and for simplicity I shall refer to them as 'yaks.'

[82] Sichuan Provincial Archives, Min 民 249-1-24.

bureau cast aspersions on the claim that all these animals belonged to one family. Even if that were true, they countered, "he not only allowed his cattle to graze far from home, but deliberately ignored our warnings."[83]

So it was ironic when, during the following month, Manzigou villagers accused Taining animals of trespassing on their land—a plaint that seemed to challenge the superiority of the site's modern husbandry. Khampa households in Manzigou claimed that on the second day of the fifth lunar month (June 4), 'hundreds' of bovids from the Niujiaoshi branch had encroached on the highland barley plots on the site of the village, devouring and trampling young sprouts over a period of six nights. Taining records showed that the host (*zhuchiren* 主持人) of the Niujiaoshi pastures, named Chen De 陳德, had indeed traveled to the Bamei Branch on the ninth to report that he was missing 17 head of yak from his pastures and hadn't been able to locate them in the branch site's immediate surroundings. They were soon located at the farms of the Shaowusi 少烏寺 branch. Had they spent the previous six nights trespassing in Manzigou?

Principles of bureaucratic management, ostensibly the safeguard against such incidents, became the site's first line of defense. First, notes Duan, though the animals "loved to roam" (*hao dong* 好動), at night they were kept in a circle of Khampa tents fastened tightly to one another so that they could not escape. Secondly, four watchmen (*kanshou* 看守) were appointed to Niujiaoshi each night and would have seen the escaping bovines. Chen De himself never left the pastures. Finally, the site kept careful tallies of its animals, and though 17 head had briefly disappeared, the figure of 'hundreds' reported by Manzigou was impossible—Niujiaoshi did not even have that many! "We hereby wish to report the true story," Duan wrote to Liu Wenhui, "and the conspiracy against the facts."[84]

Liu ultimately sided with the bureau in dismissing the suit. But whatever truly happened in the fifth month of 1943, Duan's report paints the Chinese state at Taining as a syncretic entity—both bureaucratic and nomadic, Han and Tibetan—neither fully in control of its animals nor immune from grasslands politics. Directing the convergence of such seemingly disparate social categories, I would argue, was the yak itself: the creature that, by Duan's own admission, "loves to roam." If domestication is popularly imagined to be "a social appropriation of—or intervention in—the separate domain of nature, within which animal existence is fully contained," as Timothy Ingold puts it, the degree to which these same animals intervene in human life suggests something interesting about domestication as a project: that it also threatens to disrupt the orderliness

[83] Sichuan Provincial Archives, Min 民 249-1-24.
[84] *Ibid.*, p. 5.

with which modern humans have hoped to distinguish themselves from nature.[85]

Livestock as Cultural Vectors

The mission to 'improve' the yak was motivated by a certain amount of ethnic chauvinism and cultural misunderstanding, yet by no means was it an obvious outcome thereof. At a time when much Chinese discourse derided Tibetan nomadism as the antithesis of Han civilization, it is remarkable that a community of Han Chinese technicians settled into the grasslands alongside Khampa Tibetans and engaged in a form of mobile yak herding, albeit under circumstances that were arguably colonial. The work of the Bureau of Agricultural Improvement depended on the uncredited work of indigenous peoples in domesticating and maintaining the yak over ten millennia—labor encoded in that animal's very DNA—as well as the skills of the Khampa communities that provided the animals in Taining and almost certainly had a hand in raising them. In these ways Tibetans exerted influence on the Chinese community at Taining, while Chinese settlers exerted influence in the other direction by incorporating the yak into a scientific, industrial mode of production.

The importance of indigenous knowledge to colonial livestock development is further suggested by a 1956 Canadian attempt to introduce yak farming to the indigenous Inuit of Ungava Bay that failed outright after Canadian authorities misjudged the reproductive cycle of the yak, which they had imported from India, while the intended recipients, who had no prior contact with *Bos grunniens*, rejected the scheme.[86] The Taining site was comparatively successful. Its legacy has yet to be fully explored, but today the Kham region remains a center of both scientific research on yak production and industrial yak farming. Historian Wang Chuan 王川 traces the legacy of the Taining Experimental Zone through the communist era, culminating in the Agricultural and Pastoral Scientific Research Institute (*Nongmuye kexue yanjiusuo* 农牧业科学研究所) established in Kham in 1963.[87] Yak meat has become accessible and inexpensive throughout China thanks to companies like the Sichuan-based Hongyuan Yak Meat Food Company (*Sichuan hongyuan maoniu rou shipin youxian gongsi* 四川红原牦牛肉食品有限公司), which alone slaughters some 25,000 head per year.[88]

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[85] Ingold (2000), p. 74.

[86] Meren (2017); see also Warnica (2017).

[87] Wang (2005), p. 69

[88] *Sichuan hongyuan maoniu rou shipin youxian gongsi*.

But yaks are more than meat and dairy; as the Manzigou trespassing case so vividly illustrates, the yak had its own will and proclivities. How, then, should we conceptualize its relationship to culture? Do livestock represent material culture, or are they cultural beings in their own right? Juliet Clutton-Brock, addressing just such a question, writes that "a domestic animal is a cultural artifact of human society, but it also has its own culture, which can develop, say in a cow, either as part of the society of nomadic pastoralists or as a unit in a factory farm."[89] This suggests a two-tiered view of culture: there are *human cultures* within which animal bodies feature as artifacts, and *animal cultures* internal to those bodies. I find this two-tiered formula unsatisfying, however, because it bends over backwards to preserve a notion of 'human culture' as an isolable object of analysis. A less circuitous alternative is that cultures are never purely human.[90] Epidemiologists think about pathogens in such terms: they know that animal bodies, as 'vectors,' are critical not only to the transmission of human diseases, but also to their emergence and metamorphosis. We might similarly think of animals like the yak as *cultural vectors* whose morphology and behavior play a steady but somewhat unpredictable role in ethnic and cultural interactions.

The very fact that certain colonial powers of the twentieth century turned to livestock to consolidate power over nomadic populations suggests that these animals were indispensable. As Chinese technicians embarked on yak 'improvement' in the 1940s, Japanese technicians in Manchukuo worked to improve sheep husbandry in Inner Mongolia; Sakura Christmas notes that by introducing 'improved' sheep breeds and planting alfalfa on the steppe (measures that reduced the need for mobility), the Japanese maintained the herder identity of their Mongolian subjects while undermining their transhumant way of life. Notably, this ovine program facilitated a hybrid form of social organization that melded traditional Mongolian clan-based structures with the settled land-based structures desired by the Japanese.[91] The present essay reveals a parallel melding of indigenous Khampa and settler Chinese sensibilities in Taining. The hybrid social arrangement entailed in these livestock efforts suggests that such livestock were more than resources; they were vectors of cultural exchange.

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[89] Clutton-Brock (2012), p. 6.

[90] David Bello makes a similar point regarding ethnic identities in the Qing borderlands, writing that "any ethnic identity formation was… not just cultural, but also ecological;" Bello (2016), p. 3.

[91] Christmas (2016), pp. 123-137.

Figure 3. A yak and dzo herd on the move near Lhagang in Gardze Prefecture, Sichuan in 2016.

Source: Author.

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